AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) An etching apparatus comprising:

(a) a rotating means for holding a semiconductor wafer and ~~5~~ for rotating said wafer in a horizontal plane~~;~~, wherein said wafer ~~having~~ comprises a device area and a surface peripheral area on ~~it's~~ a first surface~~;~~, said surface peripheral area being located outside said device area; and

~~(b)~~ an edge nozzle for emitting an etching liquid toward ~~a~~ the surface peripheral area of said wafer~~;~~, wherein said etching liquid emitted from said edge nozzle selectively etches out an unnecessary material existing in said surface peripheral area of said wafer,

wherein said etching liquid emitted from said edge nozzle has an emission direction oriented along a rotation direction of said wafer or outward with respect to a tangent of said wafer formed near a contact point of said liquid with said surface peripheral area of said wafer.

2. (Cancelled)

3. (Currently Amended) The apparatus according to claim 1, further comprising a back nozzle for emitting an etching liquid toward a ~~back~~ center of a back surface of said wafer~~;~~,

wherein said etching liquid emitted from said back nozzle etches out an unnecessary material existing on ~~a~~ the back surface of said wafer.

4. (Currently Amended) The apparatus according to claim 1, further comprising a ~~5~~ surface nozzle for emitting a protecting liquid toward a ~~surface~~ center of a first surface of said wafer~~;~~,

wherein said protecting liquid emitted from said surface nozzle covers said device area of said wafer to protect the same against said etching liquid emitted from said edge nozzle.

5. (Currently Amended) The apparatus according to claim 1, further comprising a back nozzle for emitting an etching liquid toward a ~~back~~ center of a back surface of said wafer and a surface nozzle for emitting protecting liquid toward a ~~surface~~ center of the first surface of said wafer~~;~~,

wherein said etching liquid emitted from said back nozzle etches out an unnecessary material existing on ~~a~~ the back surface of said wafer, and said protecting liquid emitted from said surface nozzle covers said device area of said wafer to protect the same against said etching liquid emitted from said edge nozzle.

6. (Original) The apparatus according to claim 1, wherein said etching liquid emitted from said edge nozzle is beam-shaped.

7. (Currently Amended) The apparatus according to claim 1, wherein said rotating means is of a roller-chucking type, ~~in which said means comprises~~ comprising rollers arranged along an end face of said wafer~~, and said rollers are contacted with said end face of said wafer~~ to hold said wafer and ~~rotated~~ rotate said wafer synchronously.

8. (Currently Amended) The apparatus according to claim 1, wherein said rotating means is of a pin-chucking type~~, in which said means comprises~~ comprising pins supported by a supporting member and arranged along an end face of said wafer~~, and said pins are contacted with said end face of said wafer~~ to hold said wafer axially and radially and ~~rotated~~ rotate said wafer synchronously ~~by~~ with said member.

9. (Currently Amended) The apparatus according to claim 1, wherein said rotating means is of a pin-chucking type~~, in which said means comprises~~ comprising ~~a~~ first ~~plurality of~~ pins and ~~a~~ second ~~plurality of~~ pins supported by a supporting member;

~~wherein~~ said first ~~plurality of~~ pins and said second ~~plurality of~~ pins are alternately arranged along an end face of said wafer; and

~~wherein~~ said first ~~plurality of~~ pins and said second ~~plurality of~~ pins are ~~alternately~~ alternatively contacted with said end face of said wafer to hold said wafer and ~~rotated~~ rotate said wafer synchronously ~~by~~ with said member.

10. (Currently Amended) The apparatus according to claim 1, wherein said rotating means comprises ~~a~~ first ~~plurality of~~ pins and ~~a~~ second ~~plurality of~~ pins supported by a supporting member;

~~wherein~~ said first ~~plurality of~~ pins are arranged along an end face of said wafer and said second ~~plurality of~~ pins are arranged along said end face of said wafer;

~~and wherein~~ during a first period, said first ~~plurality of~~ pins ~~are contacted with~~ contact said end face of said wafer to hold said wafer and ~~rotated~~ rotate said wafer synchronously ~~by~~ with said member ~~in a period~~, and said second pins do not contact said wafer; and

during a second period, said second ~~plurality of~~ pins ~~are contacted with~~ contact said end face of said wafer to hold said wafer and ~~rotated~~ rotate said wafer synchronously ~~by~~ with said member ~~in another period~~, and said first pins do not contact said wafer.

11. (Currently Amended) The apparatus according to claim 1, wherein:

~~the~~ a distance of an end of said edge nozzle from a point where a longitudinal axis of said edge nozzle intersects said first surface of said wafer is set as a value in the range of 1 mm to 50 mm~~,~~; and

the angle of said edge nozzle with respect to a tangent of said wafer at said point, in a plane angled toward the first surface of the wafer, is set as a value in the range of 0° to 90°.

12. (Currently Amended) The apparatus according to claim 3, wherein the distance of an end of said back nozzle from said ~~back~~ center of the back surface of said wafer is set as a value in the range of 70 mm to 200 mm, and the angle of said back nozzle with respect to said back surface of said wafer is set as a value in the range of 15° to 60°.

13. (Currently Amended) The apparatus according to claim 4, wherein the distance of an end of said surface nozzle from said ~~surface~~ center of the first surface of said wafer is set as a value in the range of 70 mm to 200 mm, and the angle of said surface nozzle with respect to said first surface of said wafer is set as a value in the range of 15° to 60°.

14. (Currently Amended) A cleaning apparatus comprising:

~~(a)~~ a rotating means for holding a semiconductor wafer and for rotating said wafer in a horizontal plane~~;~~, wherein said wafer ~~having~~ comprises a device area and a surface peripheral area on ~~it's~~ a first surface~~;~~, said surface peripheral area being located outside said ~~15~~ device area; and

~~(b)~~ an edge nozzle for emitting a cleaning liquid toward ~~a~~ the surface peripheral area of said wafer~~;~~, wherein said cleaning liquid emitted from said edge nozzle selectively removes an unnecessary material existing in said ~~20~~ surface peripheral area of said wafer,

wherein said cleaning liquid emitted from said edge nozzle has an emission direction oriented along a rotation direction of said wafer or outward with respect to a tangent of said wafer formed near a contact point of said liquid with said surface peripheral area of said wafer.

15. (Cancelled)

16. (Currently Amended) The apparatus according to claim 14, further comprising a ~~5~~ back nozzle for emitting a cleaning liquid toward a ~~back~~ center of a back surface of said wafer~~;~~,

wherein said cleaning liquid emitted from said back nozzle removes an unnecessary material existing on ~~a~~ the back surface of said wafer.

17. (Currently Amended) The apparatus according to claim 14, further comprising a surface nozzle for emitting a protecting liquid toward a ~~surface~~ center of the first surface of said wafer~~;~~,

wherein said protecting liquid emitted from said surface nozzle covers said device area of said wafer to protect the same ~~15~~ against said cleaning liquid emitted from said edge nozzle.

18. (Currently Amended) The apparatus according to claim 14, further comprising a back nozzle for emitting a cleaning liquid toward a ~~back~~ center of the back surface of said wafer and a surface nozzle for emitting protecting liquid toward a ~~surface~~ center of the first surface of said wafer~~;~~,

wherein said cleaning liquid emitted from said back nozzle etches out an unnecessary material existing on ~~a~~ the back surface of said wafer, and said protecting liquid emitted from said surface nozzle covers said device area of said wafer to protect the same against said cleaning liquid emitted from said edge nozzle.

19. (Original) The apparatus according to claim 14, wherein said cleaning liquid emitted from said edge nozzle is beam-shaped.

20. (Currently Amended) The apparatus according to claim 14, wherein said rotating means is of a roller-chucking type~~, in which said means comprises~~ comprising rollers arranged along an end face of said wafer~~, and said rollers are contacted with said end face of said wafer~~ to hold said wafer and ~~rotated~~ rotate said wafer synchronously.

21. (Currently Amended) The apparatus according to claim 14, wherein said rotating means is of a pin-chucking type~~, in which said means comprises~~ comprising pins supported by a supporting member and arranged along an end face of said wafer~~, and said pins are contacted with said end face of said wafer~~ to hold said wafer axially and radially and ~~rotated~~ rotate said wafer synchronously ~~by~~ with said member.

22. (Currently Amended) The apparatus according to claim 14, wherein said rotating means is of a pin-chucking type~~, in which said means comprises~~ comprising ~~a~~ first ~~plurality of~~ pins and ~~a~~ second ~~plurality of~~ pins supported by a supporting member;

~~wherein~~ said first ~~plurality of~~ pins and said second ~~plurality of~~ pins are alternately arranged along an end face of said wafer; and

~~wherein~~ said first ~~plurality of~~ pins and said second ~~plurality of~~ pins are ~~alternately~~ alternatively contacted with said end face of said wafer to hold said wafer and ~~rotated~~ rotate said wafer synchronously ~~by~~ with said ~~5~~ member.

23. (Currently Amended) The apparatus according to claim 14, wherein said rotating means comprises ~~a~~ first ~~plurality of~~ pins and ~~a~~ second ~~plurality of~~ pins supported by a supporting member;

~~wherein~~ said first ~~plurality of~~ pins are arranged along an end face of said wafer and said second ~~plurality of~~ pins are arranged along said end face of said wafer;

~~and wherein~~ during a first period, said first ~~plurality of~~ pins ~~are contacted with~~ contact said end face of said wafer to hold said wafer and ~~rotated~~ rotate said wafer synchronously ~~by~~ with said member ~~in a period~~, and said second pins do not contact said wafer; and

during a second period, said second ~~plurality of~~ pins ~~are contacted with~~ contact said end face of said wafer to hold said wafer and ~~rotated~~ rotate said wafer synchronously ~~by~~ with said member ~~in another period~~, and said first pins do not contact said wafer.

24. (Currently Amended) The apparatus according to claim 14, wherein:

~~the~~ a distance of an end of said edge nozzle from a point where a longitudinal axis of said edge nozzle intersects said first surface of said wafer is set as a value in the range of 1 mm to 50 mm~~,~~; and

the angle of said edge nozzle with respect to a tangent of said wafer at said point, in a plance angled toward the first surface of the wafer, is set as a value in the range of 0° to 90°.

25. (Currently Amended) The apparatus according to claim 16, wherein the distance of an end of said back nozzle from said ~~back~~ center of said back surface of said wafer is set as a value in the range of 70 mm to 200 mm, and the angle of said back nozzle with respect to said back surface of said wafer is set as a value in the range of 15° to 60°.

26. (Currently Amended) The apparatus according to claim 17, wherein the distance of an end of said surface nozzle from said ~~surface~~ center of said first surface of said wafer is set as a value in the range of 70 mm to 200 mm, and the angle of said surface nozzle with respect to said first surface of said wafer is set as a value in the range of 15° to 60°.

27. (New)The apparatus according to claim 1, wherein said unnecessary material comprises material left over from the formation of wiring lines on the device area of the wafer.

28. (New) The apparatus according to claim 14, wherein said unnecessary material comprises material left over from the formation of wiring lines on the device area of the wafer.